

Research Article

On-farm Evaluation and Demonstration of Koekoek chicken under farmers condition in North western Tigray, Ethiopia

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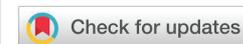
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Abstract

The demonstration trail was conducted at Tselemti district northwestern zone of Tigray. Main objective of the study was to compare production performance of the Koekoek chicken. A total of 60 female headed households were included in the study. Twenty Koekoek chicks forty-five days old were delivered to each participant farmers. Quantitative data such as age at first laying, average weight of male and female chicken, average weight of eggs, average number of egg laying per year of the chicken and qualitative data farmers point of view was collected. The collected data was analyzed using the descriptive statistics such as mean and percentage. Based on the result, the average weight for male and female Koekoek were recorded 2.65 kg and 1.82 kg, respectively. While the local chickens were gave an average weight of 2.01kg and 1.3 kg both male and female, at twelve months age, respectively. The breeds produce an average egg production of 176.03 and 81.4 hen⁻¹year⁻¹, respectively both the Koekoek and local. The result from farmers response shows, the breeds are promising in most of the attributes such as, age to egg laying and slaughter, egg laying capacity, hatchability and market price of the egg as compared to the local. But farmers raised that the breeds are poor in brooding, resistant to diseases, in escaping from predators and low market preference of the chicken than the local. By giving strong emphasis on the management aspect like housing, vaccination and feeding, the breed is promising to the area.

Introduction

Of the livestock species, poultry appears to be the most suitable and applicable intervention to improve the rural livelihoods; and is important for food security, religious reasons and poverty alleviation in developing countries [1-3]. Nearly all rural and peri-urban families in the developing world keep household poultry [4].

Of the total 59.5 million, poultry population of the country, 90.85%, 4.76% and 4.39% are indigenous, hybrid and exotic breeds, respectively [5]. Local chicken takes the higher percent in the country as well as in the study area of north western Tigray in terms of population. However, the output (egg

and meat) is low when compared to exotic chicken. The egg production potential of the local chicken is 30-60 eggs per year per hen with an average of 38 grams egg weight under village management conditions. Whereas, exotic breeds produce around 250 eggs per year per hen with around 60 grams egg weight in Ethiopia [6]. Even though the country's output obtained from poultry is low due to the highly dominance of local chicken, but the output that obtained from keeping poultry plays a great role in contribution age to income and to dietary diversity of the smallholder producers [7,8].

To improve production and productivity of chicken so as to raise its contribution to the societies, Ministry of Agriculture and Rural Development of the country have been multiplied

and disseminated several exotic chicken breeds to the farmers over the last 50 years in the country [9]. Koekoek chicken breed is one of the exotic breed types which are the composite of White Leghorn, Black Australorp and Bared Plymouth Rock [10]. Koekoek breed has a dual purpose, free ranging chicken with laying capabilities as well as a large body size for meat production. In Ethiopia, this breed was demonstrated in different parts of the country including Tigray region. In the study area Tselemti, the Koekoek breed was introduced in 2014 and the breeds was gave promising result in egg production and preferred by different traits such as egg to laying and slaughter, egg hatchability and egg production compared to the local breeds. Therefore, it is important to demonstrate this breed to large farmers of the area.

Objectives

- To demonstrate and popularize Koekoek chickens in the area.
- To evaluate the production performance of Koekoek chickens in the production system of the area.
- To assess the farmers perception towards the introduced chicken breed.

Material and methods

Description of the study area

The trial was conducted at Tselemti district of the northwestern zone of Tigray. Tselemti district is located at 1,172 km North of Addis Ababa, the capital city of Ethiopia and 389km West of Mekelle, capital city of the Tigray regional state and 85km South of Shire. Geographically Tselemti district is located at latitude and longitude of 13° 05'N and 38° 08' E, respectively, with an altitude ranging from 800–2870 meter above sea level. The district has an annual rain fall of 758mm to1100mm with mean daily temperature that ranges between 16°c to 38°c. The district is known for its mixed farming, crop and livestock in which the crop subsystem dominates over livestock. The major crops of the district are sorghum, maize, finger millet, sesame and rice. From the horticultural crops like banana, mango and papaya and vegetables like hot pepper, onion and tomato are commonly grown in the area. The dominant livestock in the area are cattle, goat, poultry and bee colonies [11].

Selection and Implementation Procedures

The target Kebelle's Sekota Mariam and Serako is located 20km and 30km respectively from the town of Maitsebri capital city of Tselemti district. The research was conducted from 2018- 2019. A total of 60 female headed interested farmers for executing the research were selected purposively from two Kebeles in consultation with development agent and administration bodies of the respective Kebeles. Then after selection training was given to a total of 67 participants including the district experts, development agents and participant farmers. A total of 1264, forty-five days old chicken, which is 20 chicks per participant farmers was offered with the financial support of Operation Research Project (OR).

Data collection and analysis

Important quantitative data such as average body weight of male and female chicken, average eggs weight and average number of egg laying day of the chicken; and qualitative data farmers point of view was collected. The collected data was analyzed using the descriptive statistics such as mean and percentage (Figure 1).

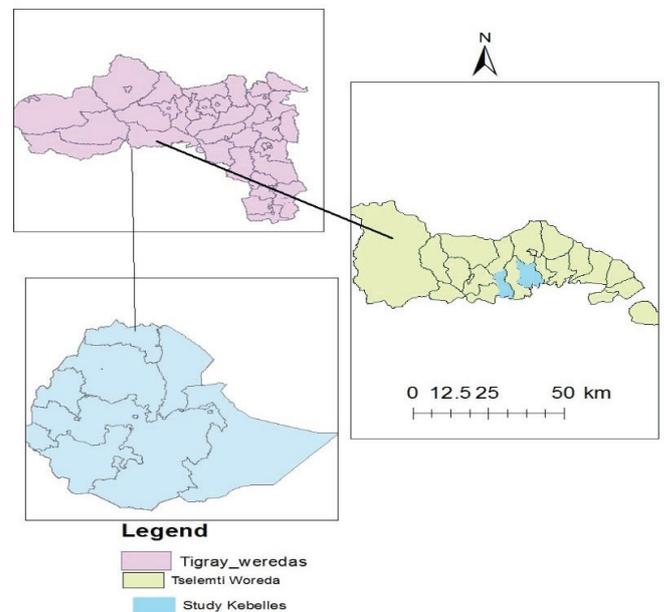


Figure 1: Map of the study area.

Results and discussions

Comparing weight of Koekoek and local chickens at 12 months age the Koekoek Chickens were heavier both male and female in the study area. Similar to this study Dessie and Ogle [12] have reported that the yearly live body weight of Koekoek were 2.6k.g and 1.9k.g for both male and female, but the local breeds have lower body weight 1.9kg and 1.6kg for male and female [12]. Gebreselassie et al. [14] also reported that the Koekoek breeds were reached 2.93kg and 1.99kg both cock and hen at 9-month age, while the local chicken weighted 1.97 and 1.06kg both sex (male and female). Similarly, Koekoek were weighted 2.6kg and 1.9kg both male and female sex on yearly ages at southern Tigray, as reported by Temesgen et al. [15].

Moreover, the average egg production performance of the breeds in the study area was 176 and 81 per year with 45.33 gram and 34.8-gram egg weight for both the Koekoek and local breeds, respectively (Table 1). In line to this study Tadelles and Fasil [16] found that egg production potentials of Koekoek were 196 eggs/bird/year with an average egg weight of 55.7 gram. Desalew in 2012 [17] also reported that the Koekoek breeds yield 187.04 eggs/hen/year. But Lemlem and Tesfay [18] found that local chicken have the egg production of 40-60 with 43 gram egg weight under village management conditions. On the other hand age at first egg was 26.1 and 29.9 weeks respectively for the Koekoek and local breeds. Similar to this



study, Tekalegn et al. [19] was found 26.7 weeks and Gezahegn et al. [20] was reported that 26.86 weeks age at first egg of the Koekoek chicken breeds. But village chickens are characterized by late maturity and the majority of the birds start laying late at 7-8 months of age [21,22].

The sampled farmers were responded that as the Koekoek chickens are more preferred in their body weight, egg production, egg hatchability, egg marketability, and age at egg laying and slaughtering weight as compared to the local chickens. But on the contrary the farmers were less preferred the breeds in the attributes of brooding ability, escape from predators and chicken marketability as compared to the local chicken (Table 2) (Figures 2,3).

The main constraints faced in Koekoek chicken production in the area is diseases followed by predators. The predators include such as snake and eagle. Mostly this could due to the poor management of the farmers and low vaccination access to the chickens.

Conclusion and recommendations

In the study area Koekoek chicken has given higher egg production, body and egg weight as compared to the local breed. The result from farmers response also shows the breeds are promising in most of the attributes such as, age to egg laying and slaughter, egg laying capacity, egg hatchability, and market price of the egg as compared to the local chicken. But farmers were less preferred that the breeds in traits brooding, resistant to diseases, escaping from predators and market preference than the local breed. Farmers becomes interested due to the breed could effectively managed for both



Figure 2: Ms. Belaynesh manage her chickens, at S/Mariam Kebelle, Tselemti district, 2018.



Figure 3: Hatched Koekoek off springs using the local hen (Ms. Alemayo Yehalay), Serako Kebelle, 2019.

egg and meat production under scavenging condition with little supplementation as compared to other improved breeds. By giving strong emphasis on the management aspects like housing, watering, feeding and vaccination; the breeds are promising to the area to enhance the meat and egg production of the poultry. Therefore, the breeds have to be scaled to large farmers of the area.

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Table 1: Comparison of Koekoek and local birds using different parameters.

SN	Parameter		Breed		Std.Error difference	P-value
			Koekoek	Local		
1	Body weight at 1 year age (kg)	Male	2.65	2.01	0.137	0.000
		Female	1.82	1.30		
2	Egg production/bird/year		176.3	81.4	5.843	0.000
3	Egg weight (gm)		45.33	34.80	2.321	0.000
4	Age at first egg (in weeks)		26.13	29.93	0.502	0.000

Table 2: Farmers response on Koekoek chicken breed as compared the local breed (n=30)

SN	Attributes	Level of Agreement				
		Very poor	Poor	No change	Good	Very Good
1	Body weight				10	90
2	Egg production				6.7	93.3
3	Egg hatchability			3.3	3.3	93.3
4	Brooding ability	83.3	16.7			
5	Scavenge ability		16.7	83.3		
6	Resistance to disease and parasite		33.3	46.7	20	
7	Escape from predators	6.7	33.3	53.3	6.7	
8	Age to egg laying				13.3	86.7
9	Resistance to feed and water shortage		26.7	73.3		
10	Egg marketability			3.3	3.3	93.3
11	Chicken marketability	6.7	40	46.	6.7	



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